## (19) World Intellectual Property Organization International Bureau





(43) International Publication Date 27 January 2005 (27.01.2005)

**PCT** 

## (10) International Publication Number WO 2005/008889 A1

(51) International Patent Classification<sup>7</sup>:

H03H 9/56

(21) International Application Number:

PCT/KR2004/001814

(22) International Filing Date:

21 July 2004 (21.07.2004)

(25) Filing Language:

Korean

(26) Publication Language:

English

(30) Priority Data:

10-2003-0049728

21 July 2003 (21.07.2003) KF

10-2004-0053959

12 July 2004 (12.07.2004) K

- (71) Applicant (for all designated States except US): SANG-SHIN ELECOM CO., LTD. [KR/KR]; 614-1, Wolhari, Suhmyon, Yunkikun, Chungcheongnam-do 339-810 (KR).
- (71) Applicants and
- (72) Inventors: KIM, Hyeong Joon [KR/KR]; 107-1303, Daelim Parktown, Soonae-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-727 (KR). LEE, Jae Bin [KR/KR]; 203, Royal Apt., 435-5, Seongnae -dong, Gangdong-gu, Seoul 134-846 (KR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): KIM, Heung Rae [KR/KR]; 201, SANGSHIN Employee Apt., 239-19, Bongmyeong 2-dong, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do 361-302 (KR). YEO, Ki Bong [KR/KR]; 105, SANGSHIN Employee Apt., 239-19,

Bongmyeong 2-dong, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do 361-302 (KR). LEE, Young Soo [KR/KR]; 402, Hwabong-2 ri, Jeongan-myeon, Gongju-si, Chungcheongnam-do 314-825 (KR).

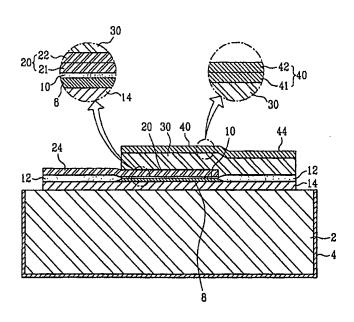
- (74) Agent: JIN, Cheon Woong; #3F, Yonghun B/D, 1542-14 Seocho-dong, Seocho-ku, Seoul 137-070 (KR).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SILICON FILM BULK ACOUSTIC WAVE DEVICE AND PROCESS OF THE SAME



(57) Abstract: The present invention relates to a film bulk acoustic wave device and a method of manufacturing the same, wherein comprising an acoustic reflective layer which is formed on a substrate by removing a sacrificial layer on the substrate and becomes an empty space; an oxidation protective film or etch protecting film which is formed in a pattern that divides a resonance region to form the acoustic reflective layer on the sacrificial layer; a thermal oxidation film which is formed by partially thermally oxidizing the sacrificial layer in an electrode region where the oxidation protective film or the etch protecting film is not formed; and a lower electrode, a piezoelectric thin film, and an upper electrode all of which are disposed on the thermal oxide. Further, the present invention is directed to a method of manufacturing the

WO 2005/008889 A1